Prevalence of intestinal helminthes parasite in stools of nursery and primary schools pupils in Uga, Anambra State, Nigeria

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The study was designed to determine the prevalence of intestinal helminthes parasite of Nursery and Primary schools pupils in Uga, Anambra State. A total of 416 stool samples were examined using the direct faecal smear method and formal ether concentration techniques. Well-structured questionnaires were administered to the pupils with the help of their teachers. Out of the 416 pupils examined, (44.71%) harboured intestinal helminthes parasites. The parasites isolated were Hookworm (21.8%), Ascaris lumbricoides (56.2%), Taenia species (28.3%), Trichuris trichiura (19%). Prevalence among female (46.1%) were higher than that of the males (43.2%), there was no significant difference between prevalence of infection and sex (P > 0.05). The age group between 3 – 5 years had the highest prevalence (66.2%) while age group between 12 – 14 years had the lowest prevalence (20.7%) and the infection reduced as age increased but there were a significant difference between prevalence of infection and age (P < 0.05). The risk factors observed in the schools are: indiscriminate defecation, open dumping of refuse dumps within school premises and pupils playing around the refuse dumps, poor source of water (absence of pipe – borne water in the study area) and lack of public health education. Health education for pupils, parents and teachers on the modes of transmission, prevention and treatment of helminthes infections is needed.

Key words: Parasitic helminthes, Ascaris lumbricoides, Trichuris trichiura, Taenia species, Hookworm, feaces, pupils, Nigeria.

INTRODUCTION

Intestinal helminthes are multicellular pathogens that infect vast number of human and animal hosts causing widespread chronic disease and morbidity (Crompton et al., 2002). Poor people in developing countries endure the burden of disease caused by four common species of soil transmitted nematodes that inhabit the gastrointestinal tract namely: Ascaris lumbricoides, Trichuris trichiura, Hookworm and Strongyloides stercoralis (Crompton et al., 2002).

In sub-saharan Africa, intestinal helminthes infections are common and of major health concerns because factors that predispose man to the para-infections such as poverty, poor sanitations, ignorance, contaminated food or water, environmental hygiene and malnutrition prevail (Igagbone, 2006).

Furthermore, the habit of playing on the sand by children resulted in very widespread parasitism with a variety of helminthes and eating habits that involve the consumption of raw vegetables, fish, crustaceans and meat allow the transmission of helminthes infection (Montressor et al., 2002). Scholar estimation indicates that soil transmitted helminthisis is among the most common of all parasitic infections (Stephenson, 1987). Also, the World Health Organization (WHO, 2003), estimates that more than one billion of the world population are infected with heminthes. Current studies estimates that 800 million people worldwide are infected with hookworm, over one billion with A. lumbricoides, 770 million with T. trichiura and 200 million with...
Schistosomiasis (Ogbe et al., 2002). At least, 400 million school pupils are chronically infected with *A. lumbricoides*, Hookworm and *T. trichiura*. Many workers have reported high prevalence among paediatric age group in Nigeria (Adeyebe et al., 2002).

It was indicated that the infection can be asymptomatic with low worm load and symptomatic with heavy worm load, condition associated with intestinal helminthes include intestinal obstruction, vomiting, weakness and stomach pain (John et al., 2006). At highest risk of morbidity are pre-school age pupils and pregnant women (Bethony et al., 2006). Negative effects of helminthes infections include diminished gastro intestinal impairment, Iron deficiency, anaemia and low birth weight in mothers (Cromptom et al., 2002). In children, growth retardation, delayed intellectual development and cognition (Hotez et al., 2008; Drake et al., 2000), Iron and vitamin A deficiency and high school absenteeism (Guyatt, 1991).

Stephenson et al. (2000) reported those children between ages of 4 and 6 have the highest prevalence of *A. lumbricoides* infection compared with other age group because at the age their immunity to parasite infections has not completely developed. These observations agreed with so many scholars who had carried out studies over the years in different parts of the country on the prevalence of intestinal helminthes infections among children. Among the scholars are (Okon and Oku, 2001) who recorded higher prevalence of parasite infections in younger children.

The major aims of this project is to access the occurrence and intensity of intestinal helminthes infection among Nursery and primary school pupils in Uga in order to serve as a guide for health planners in Anambra State in evaluating worm control program among school pupils such as mass-deworming program and also to create awareness to parents, guardians and teachers on the risk factor of helminthes infections.

MATERIALS AND METHODS

**Study area**

Uga is a rural community located in Aguata Local Government Area of Anambra state. The town is densely populated and made up of four villages: Umueze, Umuru, Oka, and Awalasi. Uga shares common boundaries in the North with Ezinifite, North East with Nkpologwu, East with Amesi, South East with Umuchu, and South with Akokwa, South East with Akpulu and Ishiokpo, West with Akwa-ihedi and North West with Unubi. The town geographically is bounded by grids 7.02’ - 7.06’ east and glide 5.56’ and 6.00’ north, situated within the equatorial rainforest belt.

**Study population**

The target population for the study was Nursery and Primary school pupils from four villages: Umueze, Umuru, Oka, and Awalasi. Using the random sampling to select four schools from the villages out of nineteen Nursery and Primary schools in the town. The schools are St. James Nursery and Primary school, Awalasi, Christ Foundation Academy Nursery and Primary school Umueze, Oka community Nursery and Primary school, Oka and St. Peter Nursery and Primary school, Umoru. 104 pupils were randomly selected and studied in each school making a total of 416 children.

**Ethical clearance**

Permission was sought and received from the authorities in charges of the four Primary and Nursery schools, who were briefed on the purpose of the research.

**Sample collection**

The pupils were supplied with specimen container labelled with serial number, name, age, sex, school and section (primary or nursery). The pupils were instructed on how to collect the stool using the container and applicator sticks. They were instructed to collect the stool specimens at the next morning and return it immediately. After which it was taken to the laboratory for analysis the same day.

**Laboratory analysis**

The faecal specimens were examined macroscopically and microscopically in the laboratory. Macroscopically examination, for the presence of blood mucor, worms, tapeworms segment and adult worm. The two different parasitological techniques used for the analysis were direct smear techniques and formal ether concentration techniques as described by WHO (1999) and (Ekwunife, 2003).

**Statistical analysis**

The data obtained in the study were represented on tables interpreted in percentages and analysed with respect to ages of pupils examined, sex of the pupils and prevalence of parasites among Nursery and Primary schools pupils. The data was analysed statistically using the chi-square method.

**RESULTS**

A total of 416 pupils between the ages of 3 to 14 years in four (4) different Nursery and Primary schools in Uga, Anambra State participated in the study and 104 samples were collected from each school. A total of 416 pupils provided proper stool samples and complete information.
Table 1. Prevalence of Intestinal helminthes according to pupils’ sex.

<table>
<thead>
<tr>
<th>Sex</th>
<th>No examined</th>
<th>No infected</th>
<th>No uninfected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>199</td>
<td>86 (43.2%)</td>
<td>113 (56.8%)</td>
</tr>
<tr>
<td>Female</td>
<td>217</td>
<td>100 (46.1%)</td>
<td>117 (53.9%)</td>
</tr>
<tr>
<td>Total</td>
<td>416</td>
<td>186 (44.71%)</td>
<td>230 (55.29%)</td>
</tr>
</tbody>
</table>

Table 2. Prevalence of intestinal helminthes according to pupils’ age.

<table>
<thead>
<tr>
<th>Age group (Year)</th>
<th>No examined</th>
<th>No infected</th>
<th>No uninfected</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 - 5</td>
<td>112</td>
<td>74 (66.2%)</td>
<td>38 (33.9%)</td>
</tr>
<tr>
<td>6 – 8</td>
<td>110</td>
<td>56 (50.9%)</td>
<td>54 (49.1%)</td>
</tr>
<tr>
<td>9-11</td>
<td>107</td>
<td>38 (35.5%)</td>
<td>69 (64.5%)</td>
</tr>
<tr>
<td>12-14</td>
<td>87</td>
<td>18 (20.7%)</td>
<td>69 (79.3%)</td>
</tr>
<tr>
<td>Total</td>
<td>416</td>
<td>186 (44.7%)</td>
<td>230 (55.3%)</td>
</tr>
</tbody>
</table>

Table 3. Prevalence per parasite among the Nursery and Primary school pupils.

<table>
<thead>
<tr>
<th>Parasite</th>
<th>Nursery</th>
<th>Primary</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taenia species</td>
<td>21(6.9%)</td>
<td>24(21.4%)</td>
<td>45(28.3%)</td>
</tr>
<tr>
<td>Hookworm</td>
<td>12(3.9%)</td>
<td>20(17.9%)</td>
<td>32(21.8%)</td>
</tr>
<tr>
<td>Ascaris lumbricoides</td>
<td>30(9.8%)</td>
<td>52(46.4%)</td>
<td>82(56.2%)</td>
</tr>
<tr>
<td>Trichuris trichiura</td>
<td>9(2.9%)</td>
<td>18(16.4%)</td>
<td>27(19%)</td>
</tr>
</tbody>
</table>

Table 4. Prevalence of Intestinal helminthes according to sanitary condition.

<table>
<thead>
<tr>
<th>Levels</th>
<th>No examine</th>
<th>No infected</th>
<th>No uninfected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bush</td>
<td>5</td>
<td>3(60%)</td>
<td>2(40%)</td>
</tr>
<tr>
<td>Pit latrine</td>
<td>365</td>
<td>173(47.4%)</td>
<td>192(52.6%)</td>
</tr>
<tr>
<td>Water system</td>
<td>46</td>
<td>10(21.7%)</td>
<td>36(78.3%)</td>
</tr>
</tbody>
</table>

Among these 199 where males and 217 were females. Four species of intestinal heminthes were identified with an overall prevalence of (44.7%), 186 out of 416 school children were infected.

It was observed that more female 217 (46.1%) had the highest prevalence than males 199 (43.2%) (Table 1). This was not significant at 50% level.

As shown Table 2, Out of the 112 pupils examined between the age 3 – 5years 74 (66.2%) were infected, 110 pupils were examined between 6 – 8 years 56(50.9%) were infected, 107 pupils were examined between age 9 – 11years 38 (35.5%) were infected. In age groups 12 – 14years, 87 children were examined and 18 (20.7%) were infected. Children between age group of 3 – 5 years (which is the Nursery section) had the highest prevalence of (66.2%) and age group between 12 – 14 years had the least prevalence of 18 (20.7%).

As shown Table 3, out of four intestinal helminthes identified, A. lumbricoides is the most prevalence with a total of 82 (56.2%) pupils infected followed by the Taenia species with 45 (28.3%) children infected, T. trichiura was the least encountered parasite with a prevalence of 27(19%).

It shows that pupils who use bush had the highest prevalence (60%) followed by pupils using pit latrine of (47.4%) and least are pupils using water system (21.7%) (Table 4).

Discussion

This study conducted among Nursery and Primary school pupils in Uga, has provided a prevalence (44.71%) and pupils between the age group of 3 – 5 years had the highest prevalence of (66.2%) which agrees with
Stephenson et al. (2000), who recorded that children of this age bracket have not developed their immune system against such parasite and these age group 3 – 5 years are also mostly infected while the intensity of parasite infection reduces with age (Nwosu, 1981). These observation could be attributed to higher exposure to the source of infection through their behavioral activities such as walking barefooted, picking things from the floor to the mouth, indiscriminate defecation in and around the school surrounding and bushes, and the habit of not washing hands properly with soap and water before meals and after using the toilet.

According to Adeyeba et al. (2002), who reported that they are more prevalent of intestinal helminthes in the tropics, which provide optimum conditions for their propagation and are also closely correlated with poverty, ignorance, poor environment hygiene, lack of toilet facilities and lack of proper health care services. This study also showed that female pupils are more infected than male pupils, it agrees with Narain et al. (2000), who had earlier observed that these differences may be related to levels of exposure.

Furthermore, the study has shown a higher rate of parasitism among pupils of Oka community Nursery and Primary school, which is located in one of the interior village where they are faced with the problem of indiscriminate refuse dumps and pupils playing close to the refuse. Again, the school is surrounded with fruit trees such as local apple, mango and orange that children have high affinity to. The pupils defecate and urinate indiscriminately around these fruit trees and the children after school hour or during break period do go to the fruit tree and pick the fallen fruits and eat without washing it. The pupils could be infected by Taenia species eggs released into the soil from their proglottids or the Ascaris eggs which could be passed with faeces into the soil and encyst on the fruits.

The risk factors of intestinal helminthes in Nursery and Primary school pupil at Uga shows that about three schools use latrine, only Christ Foundation Academy Nursery and Primary school uses water closet and the Water Closet is not properly covered, though they have low infection rate because the toilet is well taking care of by their cleaner. But in the other three schools that use latrine, they are not well taking care of and children passing excreta and urine indiscriminately on them has lead to increase prevalence of parasitic infections because it has been discovered that most of them enter the toilet barefooted and their habit of not washing their hands after using the toilet due to lack of water, has lead to high rate of this helminthiasis infection seen among them.

The study also recorded multiple infections appear to be the norm in many Nigeria community. This may be because of an already established parasite in host (children), though its activities may create an environment with the host that will be suitable for other parasite to establish.

Finally, it was observed that socio-economic status of the parent contributed to the increase in the risk factor of the infections. Most of the parents are farmers and petty traders, only few are educated with vocational skills which enable them to improve on their standard of living and most especially personal hygiene.

**Conclusion**

The result of this study reveals that the prevalence of intestinal helminthes parasite in the four Nursery and Primary schools pupils in Uga was quite high. It was observed that infection rate among children decreased with an increase in age, the lower prevalence was recorded in the age group 12 - 14 year old and this could be associated with a higher level of awareness of personal hygiene.

**REFERENCES**


